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| 10/582,930 | 06/13/2006 | Reinhold Meier | 4953/PCT | 8153 |
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| EXAMINER | | | | |
| WIEHE, NATHANIEL EDWARD | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 3745 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/582,930

Applicant(s)

MEIER ET AL.

Examiner

NATHANIEL WIEHE

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments, see page 12, filed 21 January 2009, with respect to the rejection(s) of claim(s) 13 and 16 under 35 U.S.C. § 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Halila et al. (3,825,364).

The previous objections to the specification have been overcome by Applicant's amendment.

The previous rejection of claims 15 and 16 has been overcome by Applicant's amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Halila et al. (3,825,364), hereinafter "Halila", in view of Halliwell et al. (6,062,813), hereinafter "Halliwell". Halila discloses a gas turbine engine including rotor blades (16) and an abradable shroud lining (18) arranged circumferentially around the blade tips

such that they graze the shroud lining. The shroud lining comprises a carrier (27) and an open-pored abrasable material (A,B) rigidly connected thereto that is bare and exposed such that the blades directly graze the abrasable material (A,B). The carrier (27) includes holes (26) allowing gas there through and the abrasable material (A,B) is of an open-pored structure so as to allow said gas to flow there through. Further, such gas flow is radial through the abrasable shroud lining. Halila does not disclose the use of seal fins on the radially outer blade tips or an abrasable material having a stepped contour. Halliwell discloses an abrasable shroud lining of a gas turbine engine including an abrasable material (28) having a stepped contour that is grazed by seal fins (44) extending radially from the tip (11) of rotating blades (7b). Halliwell's sealing arrangement allows for close clearances and provides an effective seal with reduced gas leakage over the blade tips. (Halliwell column 5, lines 9-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Halila by utilizing a seal arrangement having seal fins extending radially from the blade tips and a stepped contour abrasable material as taught by Halliwell for the purpose of producing close clearances and an effective seal with reduced gas leakage over the blade tips.

In regard to the claimed "metal foam", Halila's abrasable material is described as including appropriate low porosity layer (A) and a higher porosity layer (B) and is preferred formed by sintering, a process commonly used for constructing metal materials. Although such a material would appear to be the same as the claimed metal foam, Halila sheds no further light on the specific composition of the material (A,B).

However, the examiner is taking official notice that it is common practice in the art of turbine air seals to utilize a porous abradable material in the form of metal foam, see for example Bowers, Jr. et al. (3,126,149), Roesler et al. (6,412,541) and Wiegardt (2003/0107181), due to their preferable abrading properties. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the invention of Halila by incorporating a metal foam material as the porous abradable material since such a modification is well known in the art for the due to metal foam's preferable abrading properties.

In regard to claims 15 and 16, the limitation "by being glued or soldered thereto" is being treated as a product by process limitation; that is that the metal form is rigidly connected to the carrier by gluing or soldering. As set forth in MPEP 2113, product by process claims are NOT limited to the manipulation of the recited steps, only to the structure implied by the steps. Once a product appearing to be substantially the same or similar product is found, a 35 U.S.C. § 102/103 rejection may be made and the burden is shifted to applicant to show an unobvious difference. See MPEP 2113.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHANIEL WIEHE whose telephone number is (571)272-8648. The examiner can normally be reached on Mon.-Thur. and alternate Fri., 7am-4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571)272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NATHAN WIEHE/
Nathan Wiehe
Examiner
Art Unit 3745

/Edward K. Look/
Supervisory Patent Examiner, Art Unit 3745